

Appl. No. 10/047,613  
Amdt. Dated December 24, 2003  
Reply to Office Action of September 24, 2003

REMARKS

Reconsideration of the application is requested.

Applicants acknowledge the Examiner's confirmation of receipt of applicants' certified copy of the priority document for the German Patent Application 101 02 458.4, filed January 15, 2001 supporting the claim for priority under 35 U.S.C. § 119.

Claims 15-39 remain in the application. Claims 15, 17-23, 25, 28-30, 33, and 36-39 have been amended. *Claims 1-14 were previously canceled in a preliminary amendment to facilitate prosecution of the instant application.*

In item 2 on page 2 of the above-identified Office Action, claims 15-39 have been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

More specifically, the Examiner states that "decoloring absorber" is indefinite. Moreover, the Examiner believes that the term "decoloring absorber" as used in the claim is allegedly only an intended function, which is not supported in the claim by structure. As such, the Examiner asserts that the claim is indefinite, because it is not clear as to what structure applicant intends to claim.

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The term "decoloring absorber" was originally derived from the translation of "*ausbleichbares Absorbermittel*" in the previously mentioned German Patent Application. Upon further review of the translation, "*ausbleichbares Absorbermittel*" is more accurately translated as "bleaching absorber" or "an absorber for bleaching by decoloring" and corresponding changes have been made in the claims and specification. See the enclosed pages from the German to English chemical dictionary<sup>1</sup>. For example, claims 15, 36, 37, 38, and 39 have been amended to include "at least one bleaching absorber", "at least one absorber means for bleaching by decoloring", "at least one absorber layer for bleaching", "at least one absorber configured to bleach by decoloring", and "at least one absorber for bleaching by decoloring" respectively.

Support for these changes may be found on page 2, 6-8, and 10 of the specification of the instant application and are therefore not new matter. As can be seen, the claims each include both structure and function, namely an absorber for bleaching or a bleaching absorber. As such they cannot be considered indefinite. It is also noted that MPEP 2163.07 provides for this situation:

Where a U.S. application as originally filed was in a non-English language and an English translation thereof was subsequently submitted pursuant to 37 CFR 1.52 (d), if there is an error in the English translation,

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<sup>1</sup> DICTIONARY OF CHEMISTRY AND CHEMICAL ENGINEERING 14, 79 (2d ed. 1978).

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applicant may rely on the disclosure of the originally filed non-English language U.S. application to support correction of an error in the English translation document.

Accordingly, the applicant strongly disagrees with the position that the term "decoloring absorber" or "bleaching absorber" (as currently used in the amended form) is indefinite, and respectfully traverses the rejection. This is especially true in light of the exhaustive disclosure provided in the specification of the instant application. For example, on page 2 in the paragraph starting on line 19, the instant application provides the following description:

Bleaching absorbers or bleaching quantum films are known per se as optical absorbers with nonlinear absorption behavior. The transmission of the bleaching absorbers depends on the irradiated radiation intensity. With increasing power densities, the absorption decreases; at very high power densities, the absorber is substantially transparent. The use of absorber means for semiconductor lasers is known in principle (for example from US-A-5,574,738), these absorber means only being used to absorb certain wavelengths of the radiation, to achieve self-modulation of the laser diode in the GHz range.

In addition, the last paragraph on page 6 indicates that in one embodiment the "bleaching absorber means" is an 8 nm thick  $\text{In}_{0.2}\text{Ga}_{0.8}\text{As}$  quantum film. The embodiment is further described on page 7, where the bleaching by decoloring relationship relative to the transparency of the absorber means is clarified:

The transparency of the absorber means 5 increases with increasing irradiation intensity, so that at high intensities the absorber means is substantially

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transparent. In the case of such quantum films, the intensity critical for the bleaching by decoloring lies around  $1 \text{ kW/cm}^2$ .

Moreover, the last two paragraphs on page 8 clarify how the relative position of the decoloring absorber within the standing wave field 100 help determine the average intensity needed to obtain the transparent state. Page 10 of the instant application states:

Alternative forms of construction than the configuration outlined, with a plurality of thin bleaching absorber layers or solid saturable structures, are of course possible. Similarly, the structure is not restricted to the InAlGaAs semiconductor system, but can also be realized for example in the material systems of InGaAsP (for example on an InP substrate) or InAlGaAsN (for example on a sapphire, SiC or GaAs substrate). The vertical laser structure can also be realized in II-VI semiconductor systems, such as ZnMgBeS<sub>2</sub> for example.

It is accordingly believed that the specification and the claims meet the requirements of 35 U.S.C. § 112, second paragraph. The above-noted changes to the claims are provided solely for clarification or cosmetic reasons. The changes are neither provided for overcoming the prior art nor do they narrow the scope of the claim for any reason related to the statutory requirements for a patent.

In view of the foregoing, reconsideration and allowance of claims 15-39 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a

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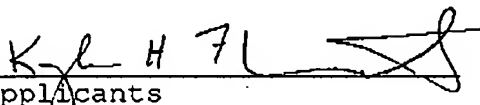
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telephone call so that, if possible, patentable language can  
be worked out.

Please charge any other fees that might be due with respect  
to Sections 1.16 and 1.17 to the Deposit Account of Lerner  
and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

  
\_\_\_\_\_  
For Applicants

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KHF:cgm

December 24, 2003

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## absondern – Absperrglied

absondern to separate, to abstract, to detach, to isolate, to segregate, (ausscheiden) to discharge, to excrete, to secrete  
 Absondern *n* isolating, separating  
 Absonderung *f* (Abtrennung) separation, (Sekretion) secretion  
 Absorbens *n* (pl. Absorbentia) absorbent [agent]  
 Absorber *m* (Kältemaschine) absorber  
 Absorberelement *n* (Reaktor) absorber device  
 Absorberregelung *f* (Kältemaschine) absorber control  
 absorbierbar absorbable  
 Absorbierbarkeit *f* absorbability  
 absorbieren to absorb, to suck up, (Gase) to occlude  
 Absorbieren *n* absorbing  
 absorbierend absorbent, absorbing  
 Absorbierungsvermögen *n* absorption capacity  
 Absorptiometer *n* absorptiometer  
 Absorptimetrie *f* absorptiometry  
 absorptimetrisch absorptiometric  
 Absorption *f* absorption, dielektrische ~ (Elektr) dielectric absorption  
 Absorptionsachse *f* absorption axis  
 Absorptionsanlage *f* absorption equipment, absorption installation, absorption plant  
 Absorptionsapparat *m* absorption apparatus  
 Absorptionsbande *f* (pl Absorptionsbande) absorption band  
 Absorptionsbehälter *m* absorption cell  
 Absorptionsbereich *m* absorption region  
 absorptionsfähig absorbent, absorptive, capable of absorbing  
 Absorptionsfähigkeit *f* absorptive capacity, degree of absorption  
 Absorptionsfaktor *m* absorption factor  
 Absorptionsfarbe *f* absorption color  
 Absorptionsfilter *n* absorption filter  
 Absorptionsflasche *f* absorption bottle, absorption flask  
 Absorptionsflüssigkeit *f* absorption liquid, washing liquid  
 Absorptionsgefäß *n* absorption vessel  
 Absorptionsgeschwindigkeit *f* absorption velocity  
 Absorptionsgesetz *n* law of absorption  
 Absorptionsgewebe *n* absorbent tissue, absorbing tissue  
 Absorptionsgleichgewicht *n* absorption equilibrium  
 Absorptionsgrenze *f* absorption limit  
 Absorptionshygrometer *n* absorption hygrometer  
 Absorptionsindex *m* (Opt) absorption index  
 Absorptionskältemaschine *f* absorption refrigeration machine  
 Absorptionskante *f* (Atom) absorption edge, absorption limit, (Spektr) absorption discontinuity, absorption edge, absorption limit  
 Absorptionskeil *m* absorption wedge

Absorptionskoeffizient *m* absorption coefficient  
 Absorptionskohle *f* absorptive charcoal  
 Absorptionskolonne *f* absorption column, washing column  
 Absorptionskraft *f* absorptive power  
 Absorptionsküvette *f* absorption cell  
 Absorptionsleistung *f* absorptive capacity  
 Absorptionslinie *f* absorption line  
 Absorptionsmaschine *f* absorption machine  
 Absorptionsmeßgerät *n* absorptiometer  
 Absorptionsmessung *f* absorption measurement  
 Absorptionsmittel *n* absorbent, absorber, absorbing medium  
 Absorptionspipette *f* absorption pipette  
 Absorptionsquerschnitt *m* absorption cross section  
 Absorptionsraum *m* absorption chamber  
 Absorptionsröhre *f* absorption tube  
 Absorptionsschleife *f* absorption coil  
 Absorptionsspektralanalyse *f* absorption-spectrum analysis  
 Absorptionsspektrum *n* absorption spectrum  
 Absorptionssprung *m* absorption discontinuity  
 Absorptionssstreifen *m* absorption band  
 Absorptionsstrom *m* (Elektr) absorption current  
 Absorptionsturm *m* absorption column, absorption tower  
 Absorptionsverbindung *f* (Chem) absorption compound  
 Absorptionsverfahren *n* method of absorption, process of absorption  
 Absorptionsverlust *m* absorption loss  
 Absorptionsvermögen *n* absorptive capacity, absorption factor, absorptive power, absorptivity  
 Absorptionswärme *f* heat of absorption  
 Absorptiv *n* absorbate  
 abspachteln to scrape [off]  
 abspänen to chip  
 abspaltbar cleavable, detachable, separable  
 Abspaltbarkeit *f* (des Elektrons) splitting off (of the electron)  
 abspalten to split off, to cleave, to crack, to eliminate, to remove, to separate  
 Abspalten *n* splitting off, cracking, eliminating, separating  
 abspaltend cleaving, cracking, splitting  
 Abspaltung *f* splitting off, cleavage, elimination, removal, separation  
 Abspannen *n* eines Werkzeuges stripping (of a mold)  
 absperierbar capable of being locked  
 Absperrröhre *f* shut-off nozzle  
 absperren to bar, to block, to cut off, to isolate, to shut off  
 absperrend blocking  
 Absperrrflüssigkeit *f* sealing liquid, confining liquid  
 Absperrrglied *n* shut-off device, sluice, valve

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Aurisulfid *n* (Gold(III)-sulfid) auric sulfide,  
 gold trisulfide  
 Auriverbindung *f* (Gold(III)-verbindung) auric  
 compound  
 Aurocantan *n* aurocantane  
 Aurochin *n* aurochin, quinine p-aminobenzoate  
 Aurochlorid *n* (Gold(I)-chlorid) aurous chloride,  
 gold monochloride  
 Aurochlorwasserstoffsäure *f* chloroauric(I) acid,  
 chloroaurous acid  
 Aurocyanid *n* (Gold(I)-cyanid) aurous cyanide,  
 gold(I) cyanide  
 Aurocyanwasserstoffsäure *f* aurocyanic acid,  
 cyanoauric(I) acid  
 Aurofelt *n* (Haarbeize) aurofelt  
 Aurokaliumcyanid *n* potassium aurocyanide,  
 potassium cyanoaurate(I)  
 Aurora *n* aurone  
 Auronalfarbe *f* aural dye  
 Aurooxid *n* gold(I) oxide, aurous oxide  
 Auropfenin *n* auropfenine  
 Aurora-Linie *f* (Spektr) auroral line  
 Aurorhodanwasserstoffsäure *f* aurothiocyanic  
 acid, thiocyanatoauric(I) acid  
 Aurotin *n* aurotine  
 Auroverbindung *f* (Gold(I)-Verbindung) aurous  
 compound, gold(I) compound  
 Auroxanthin *n* auroxanthin  
 Aurum *n* (Lat) gold  
 ausäthern to extract with ether, to etherize, to  
 shake out with ether  
 Ausäthern *n* extracting with ether  
 ausätzen to cauterize; to destroy by caustics, to  
 discharge  
 Ausätzung *f* cauterization  
 ausarbeiten to complete, to finish, to perfect, to  
 work out  
 ausarten to degenerate  
 ausatmen to exhale, to expire  
 Ausatmung *f* expiration  
 ausbalancieren to equilibrate, to balance, to  
 compensate, to counterbalance, to  
 counterpoise  
 Ausbalancierung *f* balancing, counterbalancing,  
 equilibration  
 Ausbau *m* development, completion, extension  
 ausbauchen to emboss, to hollow out, to swell  
 Ausbauchung *f* bulge, camber, widening  
 ausbauen to complete, to improve; (Teile) to  
 disassemble, to dismount  
 ausbedingen to reserve, to stipulate  
 ausbeizen to remove with corrosive  
 ausbessern to repair  
 ausbesserungsbedürftig in want of repairs  
 Ausbesserungsmasse *f* lining material for repairs  
 Ausbesserungswerkstatt *f* repair shop  
 ausbeulen to round out, to swell out  
 Ausbeute *f* conversion (polymerization):  
 efficiency, gain, output, profit, (Chem) yield,

photoelektrische - photoelectric yield,  
 photoelectric emissivity  
 Ausbeuteerhöhung *f* increase in yield  
 Ausbeutegleichung *f* (Atom) gain equation  
 Ausbeutekurve *f* yield curve  
 Ausbeutematrix *f* efficiency matrix  
 Ausbeutemessung *f* yield measurement  
 Ausbeutetensor *m* efficiency tensor  
 Ausbeutung *f* exploitation, utilization, (Bergbau)  
 winning, working  
 ausbiegen to bend out, to deflect, to turn out  
 Ausbiegung *f* deflection  
 ausbilden to develop, to improve  
 Ausbildung *f* formation; development:  
 education, ~ der Asymmetrie formation of  
 asymmetry  
 Ausblasedampf *m* exhaust steam  
 Ausblasehahn *m* blow-off cock, drain cock  
 Ausblaseleitung *f* escape pipe, blow-off main,  
 blow-off pipe  
 ausblasen (Dampf) to blow off, to exhaust,  
 (Kerze) to blow out  
 Ausblasen *n* blowing out  
 Ausblaseventil *n* blow-off valve  
 ausbleiben to vanish, to disappear  
 Ausbleiben *n* absence, disappearance  
 ausbleichen to discolor, to bleach by decoloring,  
 to fade, to lose color  
 Ausbleichen *n* bleaching, ~ durch Abgase *f pl*  
 gas fume fading  
 Ausbleichverfahren *n* bleaching-out process  
 ausblenden to line with lead  
 ausblenden (Elektr) to shield, (Opt) to collimate  
 Ausblick *m* outlook, prospect  
 ausblühen (Chem) to effloresce  
 Ausblühen *n* bloom, blooming, efflorescing  
 Ausblühung *f* bloom, efflorescence, (Schweiß)  
 blistering  
 Ausbluten *n* bleeding (of colors)  
 Ausblutung *f* bleeding (of colors)  
 ausbohren to bore out, to drill  
 ausbrechen to break out  
 Ausbrechen *n* break-away  
 ausbreiten to spread out, to display, to extend, to  
 flatten; to permeate  
 Ausbreitprobe *f* flattening test, flow test,  
 hammering test  
 Ausbreitung *f* diffusion; flattening out:  
 propagation  
 Ausbreitungsfeld *n* (Comp) propagate field  
 Ausbreitungsgeschwindigkeit *f* velocity of  
 propagation  
 Ausbreitungsparameter *m* propagation  
 parameter  
 Ausbreitungsproblem *n* propagation problem  
 Ausbreitungsrichtung *f* direction of propagation  
 Ausbreitungswiderstand *m* diffusion resistance,  
 resistance to spreading





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App. No. 10/047,013  
Pmt. Dated December 24, 2003  
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vertical laser diode with an integrated ~~decoating~~ absorber layer 30 with an bleaching absorber means 5. The vertical laser diode having, as the lowermost layer, an n-doped GaAs substrate 1, which is provided with a GaInAs contact 10.

Please replace the paragraph beginning on page 6, line 6 with the following amended paragraph:

The structure outlined in figure 1 of a vertical laser diode with an integrated ~~decoating~~ bleaching absorber layer 30 with an absorber means 5 has, as the lowermost layer, an n-doped GaAs substrate 1, which is provided with a GaInAs contact 10.

Please replace the two paragraphs beginning on page 6, line 28 and page 7, line 1 with the following two amended paragraphs:

Arranged in the absorber layer 30 as the ~~decoating~~ bleaching absorber means 5 is an 8 nm thick In<sub>0.2</sub>Ga<sub>0.8</sub>As quantum film. This is surrounded on both sides by in each case 10 nm thick GaAs barriers, these layers all having a doping of  $p = 5 \cdot 10^{17} \text{ cm}^{-3}$  (see figure 2).

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PAGE 17 \* RCVD AT 12/24/2003 4:35:09 PM [Eastern Standard Time] \* SVR:USPTO-EFXXF-1/0 \* DNIS:8729306 \* CSID:+9549251101 \* DURATION (mm-ss):07-14

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| Applic. No.   | : 10/047,613   | Confirmation No.:  | 5759 |
| Applicant   | : Nori Joseph Ebeling, et al.                              |                    |      |
| Filed   | : January 15, 2002   |                    |      |
| Art Unit  | : 2838   |                    |      |
| Examiner  | : James H. Davis   |                    |      |
| Title   | : Vertical Laser Diode with Means for Beam Profile Forming |                    |      |
| Docket No.  | : MEN-IT 213   |                    |      |
| Customer No.  | : 24131  |                    |      |
| <b>A M E N D M E N T</b>  |  |                    |      |
| Mail Stop Non Fee Amendment<br>Hon. Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, VA 22313-1450  |  |                    |      |
| C I S :   |  |                    |      |
| Responsive to the Office Action dated September 24, 2003  |  |                    |      |
| kindly amend the above-identified application as follows:   |  |                    |      |
| Amendments to the Specification begin on page 2 of this paper.  |  |                    |      |
| Amendments to the Claims are reflected in the listing of claims which begins on page 10 of this paper.  |  |                    |      |
| Remarks/Arguments begin on page 17 of this paper.   |  |                    |      |
| - 2 -   |  |                    |      |
| PAGE 17 * RCVD AT 12/29/2003 10:23:29 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:+9549251101 * DURATION (mm:ss):07:14                               |  |                    |      |

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Appl. No. 10/047,613  
And: Dated December 24, 2003  
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SPECIFICATION AMENDMENTS

Please replace the previously presented paragraph starting on page 1, line 7 with the following amended paragraph:

The invention relates to a laser diode with a vertical resonator having a shaper for shaping the beam profile of the laser diode with at least one bleaching ~~decolorizing~~ absorber in a vertical resonator and to an optical system, in particular a CD player or a data transmission system, with such a laser diode

Please replace the three previously presented paragraphs on page 2, starting on line 5 with the following three amended paragraphs:

This object is achieved according to the invention by a laser diode with a vertical resonator having a shaper for shaping the beam profile of the laser diode with at least one bleaching ~~decolorizing~~ absorber in a vertical resonator.

An important part of the invention is the introduction of a means for beam profiling, the means having at least one absorber means with a bleaching by decolorizing (saturable) absorber.

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Alternative means of construction than the configuration outlined, with a plurality of thin decoloring bleaching absorber layers or solid saturable structures, are of course possible. Similarly, the structure is not restricted to the InAlGaAs semiconductor system, but can also be realized for example in the material systems of InGaAsP (for example on an InP substrate) or InAlGaAsN (for example on a sapphire, SiC or GaAs substrate). The vertical laser structure can also be realized in II-VI semiconductor systems, such as ZnMgBosGa for example.

Please replace the paragraph beginning on page 10, line 23 with the following amended paragraph:

In the embodiment described here, only one absorber means is used in the vertical resonator. It is also possible in principle, in alternative embodiments, to use the principle of transverse mode selection for integrating a plurality of decoloring bleaching or saturable absorber means. This is appropriate in the case in which, for example, a plurality of active layers are provided in a stack of layers, as occurs in the case of a multistage vertically emitting laser diode (cascaded laser diode). In cascaded laser diodes, the active regions are electrically coupled with one another by tunnel

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PAGE 1/2 \* RCVD AT 12/29/2003 6:21:10 PM [Eastern Standard Time] \* SVR:USPTO-EFXXF-1/0 \* DNIS:8729306 \* CSID:+9549251101 \* DURATION (mm:ss):07:14

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diodes operated in the reverse direction, thereby achieving a  
higher optical gain in the vertical resonator.

Please replace the paragraph beginning on page 11, line 7  
with the following amended paragraph:

In any event (i.e. in the case of one or more absorber means  
5), the optical bleaching by decoloring of the absorber can  
be additionally replaced by local current constriction.

PAGE 10 \* RCVD AT 12/29/2003 6:23:20 PM [Eastern Standard Time] \* SVR:USPTO-EFXRF-1/0 \* DNIS:8729306 \* CSID:+9549251101 \* DURATION (mm:ss):07:14

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Appl. No. 10/017,623  
AMT. Dated December 24, 2003  
Reply on Office Action of September 24, 2003layer in said vertical resonator, said layer having a  
thickness greater than a quarter of a material wavelength.23 (currently amended): The laser diode according to claim  
15, wherein said at least one absorber (5) has a current  
constrictor.24 (previously presented): The laser diode according to claim  
23, wherein said current constrictor is a combination of a  
medium of said absorber with one of the group consisting of  
an oxide aperture and proton implantation.25 (currently amended): The laser diode according to claim  
15, wherein said at least one absorber (5) has a means for  
current constrictor26 (previously presented): The laser diode according to claim  
25, wherein said current constricting means is a combination  
of a medium of said absorber with one of the group consisting  
of an oxide aperture and proton implantation.27 (previously presented): The laser diode according to claim  
16, wherein said pn junction has a p-contact and an n-contact  
each to be connected to a respective one of two electrical  
supply leads.

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